

ABSTRACT

A support for an array of fluorescently labeled samples comprises a transparent body defining:

(a) an array-support surface and (b) under the support surface, in spaced apart relationship thereto, a field of embedded optical features exposed to be illuminated by a broad light beam of excitation radiation addressed to the support from a predetermined general direction selected to produce a surface wave effect at the support surface, the field of embedded optical features and the support being so constructed that light of the beam incident on the features is launched through the support at an angle to the support surface that produces the surface wave effect of radiation in the manner that it can produce fluorescence from the labeled samples to be imaged beyond the support from a direction different from the direction of the illumination. Fine transmissive and reflective features having surfaces generally normal to radiation substantially at the critical angle, and a grating illuminated at a non-normal surface are shown. A data acquisition system employing an elastic rotary motion reducer driven by a stepper motor, under computer control, directs a broad illumination beam through a series of small angular increments, an image is taken at each increment by a CCD camera, and based upon energy references on the array-support surface, a quilt image is formed, based on responses of the energy references associated with localized regions of each image.